

CLAIMS

What is claimed is:

1. A base station having a plurality of transmitting antennas, the base station comprising:

means for transmitting from each transmitting antenna, a reference signal having a code uniquely associated with that antenna; and

means for transmitting a data signal such that different spread spectrum versions of the data signal are transmitted from each antenna, each version having a different code for the respective transmitting antenna.
2. The base station of claim 1 wherein the means for transmitting a data signal transmits a plurality of data signals, such that spread spectrum versions of each data signal are transmitted from each antenna, each version having a different code for the respective transmitting antenna.
3. The base station of claim 2 wherein each version has a different code than the code for any of the versions of the plurality of data signals.

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4. The base station of claim 1 wherein the base station transmissions are in a time division duplex format.

5. A base station comprising:

a plurality of transmitting antennas for transmitting a plurality of reference signals and data signal versions, each transmitting antenna operatively coupled to a reference signal generator and a mixer;

a plurality of reference signal generators, each reference signal generator generating a code uniquely associated with its operatively coupled to antenna;

a data signal generator for producing a data signal; and

a plurality of mixers for producing the plurality of the data signal versions, each mixer for mixing the data signal with a different code to produce one of the versions for that mixer's coupled to antenna.

6. The base station of claim 5 further comprising at least one additional data signal generator for producing at least one additional data signal;

for each at least one additional data signal generator, a plurality of mixers for producing a plurality of versions of that at least one additional data signal, each version

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having a different code for transmission over a respective transmitting antenna of the transmitting antennas.

7. The base station of claim 5 wherein the base stations transmissions are in a time division duplex format.

8. A user equipment comprising:

a receiving antenna for receiving reference signals and data signal versions, each reference signal received from a different antenna from a single transmission site and each data signal version received from a different antenna from a single transmission site;

means operatively coupled to the receiving antenna for filtering received reference signals using a code associated with the reference signals and weighting each filtered reference signal by a particular weight;

means for combining the weighted first signals to produce a combined signal and adaptively adjusting each of the reference signal's particular weight based on in part a signal quality of the combined signal; and

means for filtering each data signal version with a code associated with that data signal version and combining the filtered versions to recover data.

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9. The user equipment of claim 8 receiving transmissions in a time division duplex format.

10. The user equipment of claim 8 further comprising means for weighting each data signal version with the particular weight of a corresponding reference signal.

11. The user equipment of claim 10 wherein the weighting each filtered first signal is performed on each finger of the filtering means.

12. The user equipment of claim 11 wherein the filtering is performed by a RAKE.

13. A user equipment comprising:

a receiving antenna for receiving reference signals and data signal versions, each reference signal received from a different antenna from a single transmission site and each data signal version received from a different antenna from a single transmission site;

a first plurality of RAKEs operatively coupled to the receiving antenna for filtering received reference signals and weighting each filtered reference signal by a particular weight;

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a combiner for combining the weighted first signals to produce a combined signal and adaptively adjusting a each of the reference signal's particular weight based on tin part a signal quality of the combined signal; and

a second plurality of RAKEs for filtering each data signal version with a code associated with that data signal version and combining the filtered versions to recover data.

14. The user equipment of claim 13 receiving transmissions in a time division duplex format.

15. The user equipment of claim 13 further comprising weighting devices for weighting each data signal version with the particular weight of a corresponding reference signal.

16. The user equipment of claim 13 wherein the weighting each filtered first signal is performed on each finger of the RAKEs.